10-2014

An Experimental Test of the Effects of Survey Sponsorship on Internet and Mail Survey Response

Michelle L. Edwards
Texas Christian University, m.l.edwards@tcu.edu

Don A. Dillman
Washington State University, dillman@wsu.edu

Jolene D. Smyth
University of Nebraska-Lincoln, jsmyth2@unl.edu

Published in *Public Opinion Quarterly* (2014), 17 pp.
doi: 10.1093/poq/nfu027

Published online October 3, 2014.

An Experimental Test of the Effects of Survey Sponsorship on Internet and Mail Survey Response

Michelle L. Edwards,[1] Don A. Dillman,[2] and Jolene D. Smyth[3]

1. Assistant professor in the Department of Sociology and Anthropology at Texas Christian University, Fort Worth, TX, USA.
2. Regents Professor and Deputy Director for Research and Development of the Social and Economic Sciences Research Center (SESRC) at Washington State University, Pullman, WA, USA.
3. Associate professor in the Department of Sociology and Director of the Bureau of Sociological Research at the University of Nebraska–Lincoln, Lincoln, NE, USA.

Corresponding author — Michelle L. Edwards, Department of Sociology and Anthropology, Texas Christian University, Fort Worth, TX, 76129, email m.l.edwards@tcu.edu.

Abstract

Survey researchers have typically assumed that university sponsorship consistently increases response rates and reduces nonresponse error across different populations, but they have not tested the effects of utilizing *different* university sponsors to collect data from the same population. In addition, scholars have not examined how these effects differ for mixed-mode (web and mail) or mail-only data collection. To explore these questions, we conducted an experiment in spring 2012 with an address-based sample of residents from two states (Washington and Nebraska), using two university sponsors (Washington State University and the University of Nebraska–Lincoln) and two modes (a sequential "web-push" design versus a mail-only design). We found that within-state-sponsored surveys tended to obtain higher response rates than out-of-state-sponsored surveys for both "web-push" and mail-only designs. Our study also investigates the impacts of mode and sponsor on the representativeness of survey estimates.

Researchers face enormous challenges in surveying the US general public, but recent experiments have shown that address-based sampling can be effectively used to obtain general population mail and web responses ("web-push" design) as long as a paper questionnaire is provided for those who cannot or will not provide web response (Smyth et al. 2010; Messer and Dillman 2011). To increase response rates, these experiments have utilized four mail contacts, enclosed a cash incentive with the first contact and, for the web-push design, withheld an alternative mail response until the third or fourth contact. Past studies using these methods have obtained mail response rates of 50–71 percent, and web-push response rates of 44–55 percent (Smyth et al. 2010; Messer and Dillman 2011). In more recent experiments, researchers have also included a second cash incentive with the third or fourth contact to improve response rates (Messer 2012).

However, the effectiveness of these methods declined when Washington State University (WSU) sponsored surveys of residents in distant states, including Alabama and Pennsylvania (Messer 2012). In these states, WSU-sponsored surveys obtained mail response rates of 38–46 percent and web-push response rates of 31–37 percent, compared with response rates of about 48–50 percent for both designs in Washington (Messer 2012). This suggests that sample members' familiarity or support for the survey sponsor may play an important role in encouraging survey response. It also indicates that the effect of sponsorship may differ across mail and web-push designs. In this paper, we experimentally test the effects of survey sponsorship on response rates and demographic representativeness for mail and web-push designs.

Background

Research has demonstrated that sample members' attitudes toward a survey's sponsor can influence response rates and nonresponse error (Groves et al. 2012). Typically, government agencies and universities are thought to obtain higher response rates and more representative samples than surveys sponsored by commercial organizations or private businesses (Doob, Freedman, and Carlsmith 1973; Heberlein and Baumgartner 1978; Jones and Linda 1978; Fox, Crask, and Kim 1988; Edwards et al. 2002). Consequently, researchers have assumed that respondents consistently view universities and government agencies as less biased or more "neutral" than other organizations.

Scholars have overlooked the notion that various university sponsors could be perceived differently across populations. Most university-sponsored studies sampled populations located near the university, though this proximity has rarely been discussed as a reason that the university sponsorship might have a positive effect on response rates. Even when a survey was sponsored

by an out-of-state university, expectations for the effects of university sponsorship did not differ (Jones and Linda 1978). Some studies even withheld the name or location of the university sponsor in their published research (Jones and Lang 1980; Albaum 1987).

However, a few studies have demonstrated that variation in perceptions of university- and government-sponsored surveys may impact response. For example, Harris-Kojetin and Tucker (1999) found that cooperation rates on the Current Population Survey were higher when the public held more positive opinions of government and government leaders. In Kentucky, the home of two rival universities, Jones (1979) found that surveys sponsored by the University of Kentucky increased response rates in counties immediately surrounding the sponsor's location, but decreased response rates in counties located in the competing university's region. Social-exchange theory suggests that sample members may perceive sponsors with whom they are connected or familiar as more trustworthy, and thus respond more cooperatively (Fan and Yan 2010). While most previous studies have focused on response rates, Groves et al.'s (2012) work has demonstrated that support for or favorability toward a sponsor can influence nonresponse error as well.

Another point of note is that much previous research concerns mail surveys, not web. Boulianne, Klofstad, and Basson (2010, 79) argue that web surveys, which typically require respondents to visit unknown websites, "raise new questions about the role of sponsorship, particularly in relation to communicating the authenticity of the survey and the importance of participation." A respondent's level of support for or familiarity with a university sponsor could reduce concerns about computer viruses, online privacy, or website reputability that may otherwise impact web response rates. Few studies have been published on sponsorship effects in web surveying. The two studies we found (Porter and Whitcomb 2003; Boulianne, Klofstad, and Basson 2010) both utilized e-mail-based contacts, varied sponsorship by considering two different departments at a single university, and found no significant differences in response rates due to sponsorship. In this paper, we address two research questions: (1) Does survey sponsorship impact response rates for mail-only and web-push survey designs? and (2) Does survey sponsorship impact demographic representativeness for mail-only and web-push survey designs?

Methods and Data

We report findings from an experiment conducted between April 13 and June 1, 2012, in a survey of Washington and Nebraska residents about water management issues. While the importance of water issues may vary by state, a prior public opinion survey on water resources obtained response rates of 64 percent

in Nebraska (in 2006) and 52 percent in Washington (in 2002) using similar methods (Mahler et al. 2013), suggesting that residents of both states are genuinely interested in water issues. Even if water is more important in one state than another, our randomization of sample members to treatment groups allowed us to effectively test the effects of sponsorship on response rates.

We sent two very similar 12-page questionnaires to equal random samples of Washington and Nebraska addresses drawn from the USPS Delivery Sequence File by GENESYS Sampling. The questionnaires were sponsored by either WSU's Social and Economic Sciences Research Center (SESRC) or the University of Nebraska–Lincoln's (UNL) Bureau of Sociological Research (BOSR). Each questionnaire asked 47 numbered questions that included up to 132 total items in Washington and up to 126 total items in Nebraska when accounting for sub-items. We used a mail-only design for half of the sample and a web-push design for the other half, in which we initially requested a web response and withheld our offer of a mail questionnaire until the final contact (a sequential mixed-mode design). Thus, this experiment incorporated eight experimental treatment groups (2 sponsors x 2 state residents x 2 modes) consisting of 600 randomly selected households, for a total of 4,800 households. For all treatment groups, we used four contacts and two token cash incentives (see table 1). Each contact was addressed to the "Resident" of the city or town associated with the sample postal address.

We stratified the sample based on urban and rural regions within each state (for more details, see Edwards 2013). For Washington, we obtained 50 percent of sampled addresses from the Washington counties west of the Cascade range and 50 percent from the counties east of the Cascades. For Nebraska, we obtained 50 percent of sampled addresses from the southeastern Nebraska counties and 50 percent from the counties in the rest of the state. In all analyses, we applied sampling weights to offset the effects of regional stratified sampling. Similar to Messer and Dillman (2011), we calculated sampling weights based on the proportion of households in each region, using 2010 Census data, divided by the proportion of households in the gross sample in each region.

Table 1. Implementation of Contacts by Survey Mode

Contact	Sent	Mail-only groups	Web-push groups
Initial	4/13	Letter, 2 x $2, questionnaire, stamped return envelope	Letter with URL, 2 x $2
Reminder	4/20	Thank-you/reminder letter	Thank-you/reminder letter with URL
Replacement	5/4	Letter, $2, questionnaire, stamped return envelope	Letter with URL, $2
Final	5/14	Final letter	Final letter, questionnaire, stamped return envelope

Standardization and coordination played key roles in this study. We utilized a unified-mode construction procedure to minimize design differences between paper and web questionnaires (Dillman, Smyth, and Christian 2009). For example, we employed comparable state-specific images to appeal to residents on the covers of the paper surveys and the log-in pages of the web surveys (see Edwards 2013). Within the mail and web questionnaires, we utilized almost identical questions, except for a few state-specific questions. In addition, all letters and envelopes were designed to look identical, with the exception of sponsorship identifiers.

Considerable effort was taken to ensure that neither sponsor stood out more than the other. The URLs, support e-mail addresses, and mailing labels were standardized as much as possible across the two universities. The same toll-free telephone helpline was provided to all sample members. All paper materials were printed, labeled, and assembled by the SESRC, using the appropriate sponsorship identifiers. Prior to official mail-out days, BOSR-sponsored materials were shipped overnight to UNL so that BOSR mailings could be sent from Lincoln, Nebraska, on the same day as SESRC mailings were sent from Pullman, Washington. All aspects of the web surveys were hosted on SESRC servers but connected, with UNL permission, to the appropriate sponsor-specific URLs.

We conducted several statistical analyses to determine the effects of sponsorship on response rates and demographic representativeness. Two-tailed chi-squared tests of independence were used to compare the number of sample members that responded versus those that did not respond across the two sponsors, considering mail-only and web-push designs separately. We calculated response rates using AAPOR's (2011) Response Rate 2 (RR2). Cases identified as "Return to Sender" by USPS were excluded as not eligible.

Though our sampling frame prevented us from conducting a full nonresponse error analysis, we compared demographic estimates from completed samples to get a sense of the potential for nonresponse error (similar to Messer and Dillman [2011]). We conducted two-tailed chi-squared tests of independence comparing demographic estimates produced using within-state- versus out-of-state-sponsored surveys, considering mail-only and web-push designs separately. We also used one-sample chi-square goodness-of-fit tests to compare demographic estimates produced by completed samples with estimates provided by the ACS (for age, sex, education, and income) and Gallup (for political ideology and political party affiliation).

These analyses considered age, sex, household income level, education level, political ideology, and political party affiliation. Sex was measured dichotomously. Age was coded to three categories: 20–44, 45–64, and 65 or older. Household income and education level were measured with three ordinal categories where higher scores indicate higher levels of education and income. Political ideology was measured using three categories: conservative,

moderate, and liberal. Political party affiliation was measured using three categories: Republican, Democrat, and Independent/Other.

Results

Effects of Sponsorship, Mode, and Location of Residents on Response

Table 2 shows response rate differences by mode, sponsor, and location of residents. In terms of sponsorship, within-state-sponsored surveys obtained higher response rates than out-of-state-sponsored surveys for both modes, though these differences were substantively larger in Nebraska than in Washington. In Nebraska, UNL-sponsored surveys achieved response rates that were 12 to 15 percentage points higher than WSU-sponsored surveys (mail-only: 57.9 to 45.5 percent, $p < 0.001$; web-push: 52.9 to 38.0 percent, $p < 0.001$). In Washington, WSU-sponsored surveys achieved response rates around six percentage points higher than UNL-sponsored surveys, though these differences were not statistically significant in either mode (mail-only: 53.2 to 47.1 percent; web-push: 43.4 to 38.1 percent).

Within the web-push treatment group, much of the advantage of in-state sponsorship is due to higher response to the web mode. Among Nebraska residents, 38.7 percent responded by web when the sponsor was in-state and 23.3 percent when the sponsor was out-of-state ($p < 0.001$). Among Washington residents, the rates were not statistically different (33.3 percent for in-state sponsor versus 27.5 percent for out-of-state, $p < 0.10$). Across both states then, in-state sponsorship resulted in a 34.5 percent response rate versus 26.7 percent for out-of-state sponsorship ($p < 0.001$). Regardless of sponsorship, similar percentages responded using the mail follow-up (Nebraska residents: 14.3 to 14.7 percent; Washington residents: 10.2 to 10.6 percent).

In the end, although the web-push treatment benefited from in-state sponsorship, it still consistently obtained lower response rates than the mail-only treatment (41.8 versus 50.5 percent, $F = 19.88$, $p < 0.001$). The differences in mail-only versus web-push response rates were statistically significant for WSU-sponsored surveys of Washington residents ($F = 8.07$, $p < 0.01$) and Nebraska residents ($F = 6.00$, $p < 0.05$), and for UNL-sponsored surveys of Washington residents ($F = 7.04$, $p < 0.01$).

We confirmed our findings using logistic regression analysis predicting response by mode (web-push = 1, mail-only = 0), sponsorship (in-state = 1, out-of-state = 0), and location of residents (NE = 1, WA = 0). In this model (results not shown), both mode (odds ratio [OR] = 0.70, $t = -4.45$, $p < 0.001$) and sponsorship (OR = 1.35, $t = 3.81$, $p < 0.001$) were statistically significant predictors of response. We also conducted a logistic regression analysis predicting response by mode, sponsorship, location of residents, and all two-way interactions between these three experimental design variables.

Table 2. Response Rate Comparisons for Selected Treatment Groups

Sponsor comparison	Location of residents, mode	Eligible sample size[a]	1st mode response rate	2nd mode response rate	Total response rate	Design-based *F*
WSU sponsor vs. UNL sponsor	WA, mail-only	557	53.2 (mail)	–	53.2	3.11#
		552	47.1 (mail)	–	47.1	
WSU sponsor vs. UNL sponsor	WA, web-push	559	33.3 (web)	10.2 (mail)	43.4	2.49
		573	27.5 (web)	10.6 (mail)	38.1	
WSU sponsor vs. UNL sponsor	NE, mail-only	561	45.5 (mail)	–	45.5	15.97***
		565	57.9 (mail)	–	57.9	
WSU sponsor vs. UNL sponsor	NE, web-push	553	23.3 (web)	14.7 (mail)	38.0	23.20***
		574	38.7 (web)	14.3 (mail)	52.9	

Weighted data used.

a. All treatment groups began with a sample size of 600. "Eligible" sample size refers to the number of addresses in the sample that were in service, determined by whether or not mailings were returned with the "Return to Sender" label.

$p \leq .10$

*** $p \leq .001$

Table 3. Demographic Comparisons by Mode, Sponsor, and State of Residence

	Washington residents						Nebraska residents					
	Mail-only			Web-push			Mail-only			Web-push		
	WSU	UNL	χ^2	WSU	UNL	χ^2	WSU	UNL	χ^2	WSU	UNL	χ^2
Age (%)												
20–44	33.2	34.3	1.4	34.2	34.3	0.3	29.8	26.4	0.9	32.5	28.7	7.8*
45–64	44.2	39.5		44.2	41.9		41.6	42.5		33.3	46.0	
65+	22.7	26.2		21.6	23.7		28.6	31.1		34.2	25.2	
Sex (%)												
Female	54.8	48.8	1.9	48.9	49.6	0.02	54.4	56.2	0.2	61.9	53.4	3.3#
Male	45.2	51.2		51.1	40.5		45.6	43.8		38.2	46.6	
Household income (%)												
Less than $50K	49.9	46.0	2.6	38.9	48.4	3.1	50.2	51.0	0.1	54.0	49.2	1.1
$50K to < $100K	31.8	29.5		38.0	30.6		31.0	31.3		31.1	36.1	
$100K or more	18.4	24.5		23.1	21.0		18.8	17.7		15.0	14.7	
Highest level of educ. (%)												
High school or less	20.6	19.6	0.25	13.4	14.1	1.2	27.9	28.3	0.0	24.4	23.1	0.3
Some college, no deg.	22.6	24.4		21.8	26.0		19.5	19.6		23.7	22.4	
2-yr, 4-yr, grad/prof	56.8	56.0		64.9	59.9		52.6	52.1		51.9	54.5	

Table 3. *Continued*

	Washington residents						Nebraska residents					
	Mail-only			Web-push			Mail-only			Web-push		
	WSU	UNL	χ^2	WSU	UNL	χ^2	WSU	UNL	χ^2	WSU	UNL	χ^2
Political ideology (%)												
Conservative	28.9	26.8	0.29	28.8	36.5	4.43	48.2	44.7	0.8	46.7	47.1	0.2
Moderate	38.8	40.6		40.2	41.3		36.3	39.9		35.8	37.1	
Liberal		32.4	32.6		31.0	22.2		15.6	15.4		17.5	15.9
Political party aff. (%)												
Republican	23.7	29.9	2.35	22.8	33.6	7.4#	43.1	48.7	7.1*	40.4	45.5	1.7
Democrat	40.8	38.4		38.1	38.9		27.3	31.6		36.0	30.2	
Independent/Other[a]	35.5	31.7		39.1	27.6		29.6	19.7		23.6	24.3	

Weighted data used.

a. For these comparisons, we combined political party affiliation responses of Independent and Other together to reduce differences between our coding and Gallup's coding of the Independent category (which includes Independent/Other/Don't Know responses).

$p \leq .10$

* $p \leq .05$

Table 4. Demographic Comparisons of 2011 American Community Survey (ACS)/Gallup Estimates for Washington versus Each of Our Estimates of Mail-Only and Web-Push Respondents by Sponsor[a]

		Mail-only groups				Web-push groups			
Variables	ACS/ Gallup estimates	WSU sponsor (diff.)	χ^2	UNL sponsor (diff.)	χ^2	WSU sponsor (diff.)	χ^2	UNL sponsor (diff.)	χ^2
Age (%)									
20–44	47.2	–14.0	22.6***	–13.3	25.5***	–13.0	14.5***	–12.9	14.3***
45–64	36.6	+7.6		+3.1		+7.6		+5.3	
65+	16.2	+6.5		+10.2		+5.4		+7.5	
Sex (%)									
Female	50.2	+4.6	2.4	–1.3	0.2	–1.3	0.1	–0.6	0.0
Male	49.8	–4.6		+1.4		+1.2		+0.7	
Household income (%)									
Less than $50K	43.6	+6.3	4.8#	+2.4	2.4	–4.7	2.1	+4.8	1.4
$50K to < $100K	33.3	–1.6		–1.6		+4.7		–2.7	
$100K or more	23.1	–4.8		–4.8		+0.0		–2.1	
Highest level of educ. (%)									
High school or less	34.8	–14.2	34.7***	–15.2	31.4***	–21.4	60.4***	–20.7	40.9***
Some college, no deg.	24.9	–2.3		–0.5		–3.1		+1.1	
2-yr, 4-yr, grad/ prof	40.4	+16.4		+15.6		+24.5		+19.5	

Table 4. *Continued*

Variables	ACS/ Gallup estimates	Mail-only groups				Web-push groups			
		WSU sponsor (diff.)	X^2	UNL sponsor (diff.)	X^2	WSU sponsor (diff.)	X^2	UNL sponsor (diff.)	X^2
Political ideology (%)									
Conservative		34.6	–5.7	6.1*	–7.8	8.5*	–5.8	4.3	+1.9
2.9									
Moderate		35.2	+3.6		+5.4		+5.0		+6.1
Liberal	26.4		+6.0	+6.2		+4.6		–4.2	
Political party aff. (%)									
Republican		23.1	+0.6	18.7***	+6.8	21.6***	–0.3	7.7*	+10.5
27.8***									
Democrat		28.6	+12.2		+9.8		+9.5		+10.3
Independent/ Other[b]	46.3	–10.7		–14.6		–7.2		–18.7	

Weighted data used.

a. ACS survey data used for Washington state estimates of age, sex, income, and education; Gallup survey data utilized for Washington state estimates of political beliefs and political party affiliation.

b. For these comparisons, we combined political party affiliation responses of Independent and Other together to reduce differences between our coding and Gallup's coding of the Independent category (which includes Independent/Other/Don't Know responses).

$p \leq .10$

* $p \leq .05$

*** $p \leq .00$

Table 5. Demographic Comparisons of 2011 American Community Survey (ACS)/Gallup Estimates for Nebraska versus Each of Our Estimates of Mail-Only and Web-Push Respondents by Sponsor[a]

		Mail-only groups				Web-push groups			
Variables	ACS/ Gallup estimates	UNL sponsor (diff.)	χ^2	WSU sponsor (diff.)	χ^2	UNL sponsor (diff.)	χ^2	WSU sponsor (diff.)	χ^2
Age (%)									
20–44	45.8	–19.4	54.1***	–16.0	29.1***	–17.0	32.4***	–13.3	30.1***
45–64	35.4	+7.1		+6.2		+10.6		–2.1	
65+	18.8	+12.3		+9.8		+6.4		+15.4	
Sex (%)									
Female	50.5	+5.7	4.1*	+3.9	1.5	+2.9	1.0	+11.4	9.8**
Male	49.5	–5.7		–3.9		–2.9		–11.3	
Household income (%)									
Less than $50K	50.6	+0.4	0.9	–0.4	1.5	–1.4	0.8	+3.4	0.7
$50K to < $100K	33.4	–2.1		–2.4		+2.7		–2.4	
$100K or more	16.0	+1.7		+2.8		–1.3		–1.0	
Highest level of educ. (%)									
High school or less	39.6	–11.3	32.4***	–11.7	27.3***	–16.5	44.9***	–15.2	22.8***
Some college, no deg.	23.7	–4.1		–4.2		–1.3		+0.0	
2-yr, 4-yr, grad/prof	36.7	+15.4		+15.9		+17.8		+15.2	

Table 5. *Continued*

Variables	ACS/ Gallup estimates	Mail-only groups: UNL sponsor (diff.)	Mail-only groups: χ^2	Mail-only groups: WSU sponsor (diff.)	Mail-only groups: χ^2	Web-push groups: UNL sponsor (diff.)	Web-push groups: χ^2	Web-push groups: WSU sponsor (diff.)	Web-push groups: χ^2
Political ideology (%)									
Conservative	45.8	–1.1	4.5	+2.4	1.3	+1.3	1.6	+0.9	0.2
Moderate	33.3	+6.6		+3.0		+3.8		+2.5	
Liberal	17.9		–2.5	–2.3		–2.0		–0.4	
Political party aff. (%)									
Republican	38.1	+10.6	36.4***	+5.0	5.4#	+7.4	18.6***	+2.3	17.9***
Democrat	24.1	+7.5		+3.2		+6.1		+11.9	
Independent/ Other[b]	36.2	–16.5		–6.6		–11.9		–12.6	

Weighted data used.

a. ACS survey data used for Nebraska state estimates of age, sex, income, and education; Gallup survey data utilized for Nebraska state estimates of political beliefs and political party affiliation.

b. For these comparisons, we combined political party affiliation responses of Independent and Other together to reduce differences between our coding and Gallup's coding of the Independent category (which includes Independent/Other/Don't Know responses).

$p \leq .10$

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

Results demonstrated a significant interaction between sponsorship and location of residents (OR = 1.38, $t = 2.41$, $p < 0.05$). Together, these findings suggest that, holding mode constant, having an in-state sponsor increased the likelihood of response, but that this effect was significantly larger for Nebraska residents than for Washington residents. Also, those assigned to the web-push treatment group were significantly less likely to respond than those assigned to the mail-only treatment group, but this effect did not significantly differ across state (OR = 1.13, $t = 0.95$) or across sponsor (OR = 1.00, $t = 0.03$).

Mode and Sponsorship Effects on Representativeness of Completed Samples

We conducted two separate sets of analyses to assess mode and sponsorship effects on the representativeness of completed samples. First, as shown in table 3, we compared demographic estimates produced by WSU- versus UNL-sponsored surveys. We found that different sponsors produced similar demographic estimates, with only a few exceptions. In Nebraska's web-push group, the distribution of respondents by age group differed between sponsors ($p < 0.05$). In Nebraska's mail-only group, the distribution of respondents by political party affiliation also differed between sponsors ($p < 0.05$). Though not statistically significant, a similar effect was observed across the other three groups, with UNL-sponsored surveys consistently obtaining higher proportions of Republican respondents than WSU-sponsored surveys.

Second, we compared demographic estimates produced by our completed samples versus American Community Survey (ACS) and Gallup estimates for the same regions and year, shown in table 4 (Washington) and table 5 (Nebraska). These data can help illuminate potential differences in nonresponse error across sponsors and modes. Results show that we consistently underrepresented younger individuals in our samples compared to ACS estimates. We also consistently underrepresented those with lower education levels, particularly in the web-push treatment groups. In addition, we obtained different percentages of individuals identifying as Republican, Democrat, and Independent/Other than Gallup estimates. Unlike with age and education, where different sponsors similarly underrepresented or overrepresented certain groups compared to ACS estimates, different survey sponsors obtained different levels of Democrats, Republicans, and Independents/Others. For example, in Washington and Nebraska, UNL-sponsored surveys tended to overrepresent Republicans more than WSU-sponsored surveys. Other comparisons produced less clear trends.

Conclusion

The findings of this study provide several important insights into the effects of sponsorship on response for mail and web-push designs with

address-based sampling. Echoing prior studies, our results demonstrate that mail-only designs continue to obtain higher response rates than web-push designs (Smyth et al. 2010; Messer and Dillman 2011). However, our experiment reveals that sponsorship also impacts response, for both mail-only and web-push designs. In Nebraska, where these effects were most prominent, not only did within-state sponsorship significantly increase response rates, but within-state-sponsored web-push surveys obtained even higher response rates than out-of-state-sponsored mail surveys. Across both states, the combination of an initial web request (i.e., web-push) and out-of-state sponsorship resulted in response rates that were 15 to 20 percentage points lower than within-state-sponsored mail-only requests.

Though differences between within-state- and out-of-state-sponsored surveys occurred in a similar direction in Washington and Nebraska, further research is needed to understand why sponsorship effects were larger in Nebraska than in Washington. For example, are the ties between Nebraska residents and UNL closer than the ties between Washington residents and WSU? Does the number of major universities in each state impact these ties? Future research is also needed to explore why sponsorship seems to impact the percentage of sample members responding by web within the web-push groups, but not the percentage of sample members responding using the alternative mail questionnaire.

This study also provides unique insights into the impacts of sponsorship on survey representativeness for mail-only and web-push designs. All sponsor/mode combinations obtained samples that similarly underrepresented younger, less educated respondents compared with ACS estimates. This mirrors the challenges that Messer and Dillman (2011) described in obtaining a representative sample of respondents in two statewide experiments they conducted in Washington using similar methods. We also noticed some differences by sponsor in our estimates of political party affiliation, both when we compared our samples to each other and when we compared our samples to Gallup estimates. This demonstrates that studies sponsored by different organizations or institutions may look demographically quite similar when comparing traits typically available in official surveys like the ACS but may be quite different on other traits such as partisan affiliation, which suggests that weighting data on available demographics may not effectively eliminate certain types of bias.

Universities have long been used to collect general public data at the local, state, and national levels, with the expectation that university-based research centers are perceived positively and similarly across different populations. Our experiment suggests that people may actually perceive university-based research centers in different ways, resulting in potential differences in response. For instance, members of the general public, especially those with strong partisan identities, may perceive different states to be affiliated with particular political parties (e.g., “red” or “blue” states). Given our findings,

we suggest that when conducting university-sponsored survey research in distant states, researchers explain to sample members why they are being contacted by an out-of-state researcher. This move could potentially ease respondent concerns and improve out-of-state response.

Perceptions of university- or government-sponsored surveys, in general, could also be changing among certain populations. Based on data from 1974 to 2010, Gauchat (2012, 183) found that conservatives, especially educated conservatives, have demonstrated declining trust in science in the United States, with particularly unfavorable attitudes toward "government funding of science and the use of scientific knowledge to influence social policy." With changes in societal perceptions of science, government, and universities, this study highlights the continued importance of studying the effects of sponsorship on survey response.

Acknowledgments – This work was supported by the US Department of Agriculture–National Agricultural Statistics Service and the National Science Foundation National Center for Science and Engineering Statistics [under cooperative agreement 43-3AEU-5-80039 to D.A.D.]. Additional support for data collection was provided by the Social and Economic Sciences Research Center at Washington State University and the Bureau of Sociological Research at the University of Nebraska–Lincoln.

References

Albaum, Gerald. 1987. "Do Source and Anonymity Affect Mail Survey Results?" *Journal of the Academy of Marketing Science* 15:74–81.

American Association for Public Opinion Research (AAPOR). 2011. "Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys." Available at http://www.aapor.org/Standard_Definitions1.htm

Boulianne, Shelley, Casey A. Klofstad, and Danna Basson. 2010. "Sponsor Prominence and Responses Patterns to an Online Survey." *International Journal of Public Opinion Research* 23:79–87.

Dillman, Don A., Jolene D. Smyth, and Leah Melani Christian. 2009. *Internet, Mail, and Mixed-Mode Surveys: The Tailored Design Method*, 3rd ed. Hoboken, NJ: John Wiley & Sons.

Doob, Anthony N., Jonathan L. Freedman, and J. Merrill Carlsmith. 1973. "Effects of Sponsor and Prepayment on Compliance with a Mailed Request." *Journal of Applied Psychology* 57:346–47.

Edwards, Michelle L. 2013. "Measuring Public Perceptions of Water Governance in Nebraska and Washington." PhD dissertation, Department of Sociology, Washington State University.

Edwards, Phil, Ian Roberts, Mike Clarke, Carolyn DiGuiseppi, Sarah Pratap, Reinhard Wentz, and Irene Kwan. 2002. "Increasing Response Rates to Postal Questionnaires: Systematic Review." *British Medical Journal* 324:1183–91.

Fan, Weimiao, and Zheng Yan. 2010. "Factors Affecting Response Rates of the Web Survey: A Systematic Review." *Computers in Human Behavior* 26:132–39.

Fox, Richard J., Melvin R. Crask, and Jonghoon Kim. 1988. "Mail Survey Response Rate: A Meta-Analysis of Selected Techniques for Inducing Response." *Public Opinion Quarterly* 52:467–91.

Gallup, Inc. 2012. "State of the States." Available at http://www.gallup.com/poll/125066/statestates.aspx.

Gauchat, Gordon. 2012. "Politicization of Science in the Public Sphere: A Study of Public Trust in the United States, 1974 to 2010." *American Sociological Review* 77:167–87.

Groves, Robert M., Stanley Presser, Roger Tourangeau, Brady T. West, Mick P. Couper, Eleanor Singer, and Christopher Toppe. 2012. "Support for the Survey Sponsor and Nonresponse Bias." *Public Opinion Quarterly* 76:512–24.

Harris-Kojetin, Brian, and Clyde Tucker. 1999. "Exploring the Relation of Economic and Political Conditions with Refusal Rates to a Government Survey." *Journal of Official Statistics* 15:167–84.

Heberlein, Thomas A., and Robert Baumgartner. 1978. "Factors Affecting Response Rates to Mailed Questionnaires: A Quantitative Analysis of the Published Literature." *American Sociological Review* 43:447–62.

Jones, Wesley H. 1979. "Generalizing Mail Survey Inducement Methods: Population Interactions with Anonymity and Sponsorship." *Public Opinion Quarterly* 43:102–11.

Jones, Wesley H., and Gerald Linda. 1978. "Multiple Criteria Effects in a Mail Survey Experiment." *Journal of Marketing Research* 15:280–84.

Jones, Wesley H., and James R. Lang. 1980. "Sample Composition Bias and Response in a Mail Survey: A Comparison of Inducement Methods." *Journal of Marketing Research* 17:69–76.

Mahler, Robert L., Michael D. Smolen, Tatiana Borisova, Diane E. Boellstorff, Damian C. Adams, and Nicola W. Sochacka. 2013. "The National Water Survey Needs Assessment Program." *National Sciences Education* 42:98–103.

Messer, Benjamin L. 2012. "Pushing Households to the Web: Experiments of a 'Web+Mail' Methodology for Conducting General Public Surveys." PhD dissertation, Department of Sociology, Washington State University.

Messer, Benjamin L., and Don A. Dillman. 2011. "Surveying the General Public over the Internet Using Address-Based Sampling and Mail Contact Procedures." *Public Opinion Quarterly* 75:429–57.

Porter, Stephen R., and Michael E. Whitcomb. 2003. "The Impact of Contact Type on Web Survey Response Rates." *Public Opinion Quarterly* 67:579–88.

Smyth, Jolene D., Don A. Dillman, Leah Melani Christian, and Allison C. O'Neill. 2010. "Using the Internet to Survey Small Towns and Communities: Limitations and Possibilities in the Early 21st Century." *American Behavioral Scientist* 53:1423–48.